

Pulse tracking in photonic crystal devices by near-field microscopy

R.J.P. Engelen¹, Y. Sugimoto³, J.P. Korterik², N.F. van Hulst²,
N. Ikeda³, K. Asakawa³, L. Kuipers^{1,2}

¹) *FOM Institute for Atomic and Molecular Physics, Amsterdam, The Netherlands*

²) *MESA+ Institute for Nanotechnology, University of Twente, Enschede, The Netherlands*

³) *The Femtosecond Technology Research Association (FESTA), Tsukuba, Japan*

The time-resolved propagation of femtosecond pulses in a composite photonic crystal device is visualized with a near-field microscope. This way truly guided light is mapped with sub-wavelength resolution. With our time-resolved method, we track the pulses as they propagate through a photonic crystal device composed of straight waveguides, 60-degree bends and a directional coupler. The near-field data allows the unambiguous quantification of the losses, reflection and transmission of the device elements individually. Novel reciprocal space movies elucidate the dynamic response of the various photonic elements and the coupling between them. The images show two snapshots of the time-resolved near-field measurements.

